Breast Cancer Detection via Microwave Imaging

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Abstract:

Breast cancer is one of the major common diseases among women and takes about 40,000 lives every year. Early detection of breast cancer greatly increases the chance of survival. The norm for today's detection of breast cancer consists of mammograms, magnetic resonance imaging (MRI), and ultrasonic examination. Unfortunately, the process is a fraction of completeness despite its feeling of discomfort, high cost, and exposure to ionizing radiation which poses cumulative side effects respectively. The present research investigates the efficiency and implementation of microwave imaging to be used in the detection of breast cancer. Microwave imaging (MWI) is a process that illuminates the breast with microwave signals, and receives and analyses scattered signals for breast cancer detection and imaging. The electromagnetic waves that are scattered within the breast provide information that are transmitted and received via microstrip patch antennas, providing an image of detected lesions. In the presented poster, design of a patch antenna and simulation results are presented. In the event of designing, the overall goal was to obtain a voltage standing wave ratio (VSWR) less than 2 at 2.4 GHz signal frequency. To receive the intended results, the dimensions and design of the microstrip patch were important factors given the substrate parameters. Currently, the project is in the prototyping stage for the validation of simulation results and further optimization and development of the antenna for microwave breast cancer detection and imaging applications.